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Efforts and Opportunities to Understand Women's Mortality Due to Suicide and Homicide Using the National Violent Death Reporting System

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Abstract

Women's mortality due to violent deaths is a public health issue that has received national attention. Many data systems only collect death certificate data, which provide very limited information about the circumstances surrounding a violent death. The Centers for Disease Control and Prevention's (CDC's) National Violent Death Reporting System (NVDRS) is the first and only surveillance system to capture data from death certificates, coroner/medical examiner reports, and law enforcement reports allowing for a more comprehensive picture and targeted prevention efforts. The system currently operates in 40 states, the District of Columbia, and Puerto Rico; however, with additional funding from the Consolidated Appropriations Act of 2018, this surveillance system will fully expand to cover all 50 states. A number of analyses have been conducted using NVDRS data to compare suicide and homicide among women with men; however, only a handful of studies have been conducted among subgroups of women. The present study provides an overview of NVDRS while highlighting a few key analytic studies with implications for suicide and homicide prevention/intervention among women. Data from the 2014 NVDRS Surveillance Summary are also presented to emphasize the unique opportunity to use NVDRS data to study the characteristics of suicide and homicide among women. The summary includes data from 18 states that were collected statewide. This information can provide state and local public health experts with essential data on female suicide and homicide, not provided in other surveillance systems, to help shape prevention and intervention efforts.

Keywords

violent death; suicide; homicide

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Introduction

ALTHOUGH SUICIDE AND homicide rates among women are not as high as rates among men, each of these forms of violent death poses a public health problem among women in its own right. Estimates from the Centers for Disease Control and Prevention's (CDC's) National Violent Death Reporting System (NVDRS) indicate that female decedents aged 35–64 years account for 61.5% of the suicides among females in 2014.[1] Analysis of NVDRS data from 2003 to 2014 revealed that more than half of homicides among women were intimate-partner violence (IPV) related.[2] Research studies that go a step further to look at these forms of violent death among specific subgroups of women have been integral in developing and informing important public health message campaigns and prevention initiatives. For example, data from early studies that identified homicide as a leading cause of death among women were used to educate decision makers about the scope of the problem for the reauthorization of the Violence Against Women Act and the Family Violence Prevention and Services Act.[3,4] Both of these laws highlight the importance of public health in helping to end violence against women, emphasizing the work necessary at all levels of the social ecological model.[5]

Public health surveillance, defined as the ongoing systematic collection, analysis, and interpretation of data, closely integrated with the timely dissemination of these data to those responsible for preventing and controlling disease and injury[6] is integral to the public health response to prevent violent deaths among women. Early studies helped to identify female occupational homicides as a public health issue.[7] More recent investigations have shown increasing suicide rates among female veterans[8] and notable increases in suicide deaths by hanging/suffocation among females.[9] These findings illustrate the continued need for comprehensive surveillance systems to help examine deaths due to homicide and suicide among women. The NVDRS is a surveillance system that has been and can continue to be used to learn more about violent deaths among women.[10]

The purpose of this report is threefold: (1) to provide an overview of NVDRS while highlighting a few key NVDRS analyses with implications for suicide and homicide prevention/intervention among women, (2) to present sociodemographics, method and location of injury, and precipitating circumstances of female decedents in NVDRS by suicide and homicide using data from the 2014 NVDRS Surveillance Summary,[1] and (3) to emphasize the unique opportunity to use NVDRS data to study the characteristics of suicide and homicide among women.

NVDRS Background and Overview

The NVDRS was created in response to an Institute of Medicine report issued in 1999 that noted the need for a national fatal intentional injury system.[11] The methods of the NVDRS have been described previously.[1,12] Briefly, NVDRS is an active, state-based surveillance system that started collecting data in 2003. Information is collected on the circumstances surrounding violent deaths in participating states. The case definition includes suicides, homicides, legal intervention deaths (*i.e.*, deaths caused by law enforcement and other persons with legal authority to use deadly force but excluding legal executions),

unintentional firearm deaths, and deaths of undetermined intent. States (or their bona fide agents) collect information from three required data sources: death certificates, coroner/medical examiner (C/ME) reports (including toxicology reports), and law enforcement reports. The uniqueness of the NVDRS is that the C/ME reports and law enforcement reports contain rich narratives that have information about the circumstances surrounding violent deaths. Information from all three required sources is entered into a web-based system by trained abstractors, according to standardized coding guidance from CDC.[13] The system has expanded over time and currently operates in 40 states, the District of Columbia, and Puerto Rico. The Consolidated Appropriations Act of 2018 includes an increase in funding to expand the NVDRS to all 50 states, allowing for a more complete understanding of violent deaths in the United States. The information from NVDRS is used as information for action—to help develop and inform violence prevention programs.

System Variables

Several variables are collected in the system that may be of interest to those studying suicide and homicide among women. While these variables are just a small fraction of the ~600 unique variables for every death that comprise the NVDRS, more detailed descriptions are available in the NVDRS Coding Manual.[13]

In addition to collecting basic demographic information for victims (age, race, sex, sexual orientation, and education level), the system collects information on pregnancy status of victims. This variable is used to identify pregnant or recently pregnant victims and to document types of violence against pregnant and postpartum women. Victim's pregnancy status is often noted on the death certificate and in the C/ME report, and this variable is based on the codes used on the new U.S. standard death certificate and collects pregnancy status at the time of death, not at the time of injury. Other variables relating to prenatal care pertain to infant victims and include whether the infant received prenatal care before the third trimester, whether the infant was born prematurely, and maternal characteristics (recreational drug use, alcohol use, and tobacco use).

NVDRS also collects information on IPV and intimate partner problems (*e.g.*, where a current or former intimate partner appears to have contributed to the suicide or undetermined death). Intimate partner problems can include a divorce, breakup, argument, jealousy, conflict, or discord that appears to have contributed to the death. A variable is also included in the system to capture an intimate partner problem crisis (*e.g.*, a woman finds out that her husband is having an affair and dies by suicide, or a victim had an argument with his wife about a drinking problem 2 days before he died by suicide). The circumstance of intimate partner problems is used with suicides and deaths of undetermined intent.

IPV is captured in the system in association with homicides, and legal intervention deaths. IPV-related incidents are defined as those in which the homicides or legal intervention is related to immediate or ongoing conflict or violence between current and former intimate partners and includes all deaths where a victim is killed by his or her current or former intimate partner. Of note, IPV can include cases that are not the intimate partners themselves (*i.e.*, corollary victims), such as where one intimate partner kills his or her partner's new

intimate partner (*e.g.*, ex-husband kills his ex-wife's new boyfriend, the child of an intimate partner, friend of the victim, or bystander). NVDRS defines intimate partner as a current or former girlfriend/boyfriend, dating partner, ongoing sexual partner, or spouse. This definition also includes same-sex partners.

Optional Modules

After the development of the NVDRS, a child fatality review (CFR) module was added to the system. The CFR module allows states to enter information from CFRs, collecting detailed information available from that source. This module also includes details about caregivers of the child victims. Shortly thereafter, an optional IPV module was added so that states interested in IPV-related homicides could collect additional information on these incidents such as victim and perpetrator characteristics and the circumstances (*e.g.*, relationship history of the intimate partners, history of IPV, system response) regarding the violent death.[12] A number of studies using NVDRS data present important findings about suicide and homicide among women in comparison with men. A few are highlighted here.

Comparative studies of suicide and homicide using NVDRS data

Suicide among middle-aged men has garnered much of the recent attention of prevention specialists[14]; however, a mixed-methods study of life stressors of middle-aged suicides using NVDRS data revealed important findings pertinent to both women and men.[15] Data from 2003 to 2011 for 17 states were included. While job/financial problems and criminal/legal problems were more common among men decedents, health and family problems were more common among women decedents. Men and women decedents had similar rates of intimate partner problems. Suicide prevention strategies such as strengthening economic supports, promoting connectedness, and others mentioned in CDC's Preventing Suicide: A Technical Package of Policy, Programs, and Practices[16] could be tailored to incorporate the differences by sex. Future studies might consider using NVDRS data to further parse out circumstances, as different life stressors may be identified among particular subgroups of women.

A separate analysis of 2003–2009 NVDRS data examined intimate partner homicide and corollary victims in 16 states.[17] Of 4,470 persons who died in the course of 3,350 IPV-related homicide incidents, intimate partners and corollary victims represented 80% and 20% of homicide victims, respectively. Corollary homicide victims included family members, new intimate partners, friends, acquaintances, police officers, and strangers, thus illustrating that IPV extends beyond the couple. Although the primary focus of this analysis was not necessarily to identify differences by sex, the findings were able to corroborate existing literature showing that most perpetrators in lethal IPV (also known as intimate partner homicide) are male and that the majority of victims are female.[18] Additional study findings highlighting differences by sex included the following: (1) female homicide victims were usually former or current intimate partners of the suspect; by contrast, men were overwhelmingly represented in suicide deaths (homicide/suicides) and suspected perpetration of multiple death incidents; (2) nearly three-quarters of corollary homicide victims were male with a portion of those victims as new boyfriends and partners killed by the former partner. Some of the victims were family members and others who intervened in

violence. Communities can promote strategies such as those highlighted in CDC's Preventing Intimate Partner Violence Across the Life Span: A Technical Package of Programs, Policies, and Practices[19] that bystanders can use to safely intervene in IPV and other violence.

While there are a number of studies that present important findings of comparative nature (male vs. female), there are currently only a handful of studies using NVDRS data to investigate homicide and suicide among women. A few are highlighted here.

Studies of suicide and homicide among women using NVDRS data

One research study used the 2003–2010 data from 16 NVDRS states to compare suicides and undetermined deaths by poisoning among women.[20] Findings revealed that female decedents with a substance use problem, a health problem, and lower education were more likely to be classified as an undetermined death. Older female decedents with an intimate partner problem, financial problem, mental health problem, depressed mood, attempted suicide, and disclosed intent were less likely to be classified as undetermined. This study raises the likelihood that many female poisoning deaths are suicides and warrant additional research in this area.

A recent analysis used NVDRS data from 2003 to 2014 in 18 states to investigate racial and ethnic differences in homicides of women, highlighting the role of IPV.[2] Results indicated that the highest rates of homicide were experienced by non-Hispanic black and American Indian/Alaska Native women, respectively. Most notably, more than half of all homicides were IPV related. Of the women who experienced IPV-related homicide, 11.2% experienced some form of violence in the month preceding their deaths. Jealousy and an argument were common precipitating circumstances. This study highlights the need for IPV prevention strategies such as those mentioned in CDC's Preventing Intimate Partner Violence Technical Package.[19] Targeted prevention efforts are needed for populations at disproportionate risk, namely non-Hispanic black and American Indian/Alaska Native women. Women experiencing IPV also need enhanced access to intervention services as part of the larger effort to reduce homicides among women.

Another study used 2005–2011 data from the North Carolina Violent Death Reporting System (NC-VDRS) to examine the improvement in ascertainment of pregnancy-associated suicides and homicides by linking data from the NC-VDRS to traditional maternal mortality surveillance files.[21] The linkage to NC-VDRS captured 55.6% more suicides and homicides occurring during the pregnancy or postpartum period than traditional surveillance alone. Linkages of this kind provide higher and more accurate mortality ratios for suicide and homicide.

An analysis of NVDRS data from 2003 to 2007 in 17 states examined homicide and suicide during the perinatal period.[22] Results indicated that deaths due to suicide during pregnancy or within the first year postpartum (pregnancy-associated suicide) were more likely to be age 40 and older, white, and American Indian compared with all live births in the NVDRS states. Victims of pregnancy-associated homicide were more likely to be age 24 and younger, age 40 and older, and African American compared with all live births in the NVDRS states. The

number of live births in the sample population was used to calculate the rates of pregnancy-associated homicide and suicide as the number of deaths per 100,000 live births. The maternal mortality rate was highest for pregnancy-associated homicide followed by suicide; however, both were higher than maternal mortality rates due to common obstetric causes, including hemorrhage or placenta previa, eclampsia and preeclampsia, and amniotic fluid embolism. It was also noted that 54.3% of pregnancy-associated suicides involved intimate partner problems that appeared to contribute to the suicide, and 45.3% of pregnancy-associated homicides were associated with IPV. This study highlights homicide and suicide as important public health issues contributing to maternal mortality while estimating the prevalence of intimate partner conflict.

A few basic demographics, method and location of injury, and precipitating circumstances of female decedents in NVDRS by suicide and homicide using data from the 2014 NVDRS Surveillance Summary[1] are presented in the next section.

Suicides

Sex, race/ethnicity, and age group.—During 2014, there were 3,396 suicides among females in the 18 NVDRS states. The rate for females was more than one-third the rate for males (6.3/100,000 and 21.9/100,000 population, respectively) (Table 1). Among females, non-Hispanic American Indian/Alaska Natives and Non-Hispanic whites had the highest rates of suicide deaths (8.0/100,000 and 7.7/100,000 population, respectively) and were lowest among Hispanic females and (2.8/100,000 population) and non-Hispanic blacks (2.3/100,000 population). The highest rates of suicide by age group among females occurred among those aged 45–54, 35–44, and 55–64 years (11.0/100,000, 9.2/100,000, and 9.0/100,000 population, respectively). Female suicide decedents aged 35–64 years accounted for 61.5% of suicides. Female youth aged 10–14 years had the lowest rates of suicide among females for all age groups (1.6/100,000 population).

Method and location of injury.—Poisoning was the method used in just over a one-third of female suicides (33.4%), followed by firearms, also about one-third (32.6%), then hanging/strangulation/suffocation (26.7%). The most common place of self-inflicted injury for females was a house or apartment (80.0%), followed by motor vehicles (3.8%), natural areas (3.3%), hotel/motel (3.2%), and street/highway (1.5%). These data are not shown.

Precipitating circumstances.—Precipitating circumstances were known for 92.1% of female suicide decedents (Table 2). Current mental health problems (62.3%) were the most commonly noted circumstance for female suicide decedents, with 36.5% described as experiencing a depressed mood at the time of their deaths. Slightly under half of female suicide decedents (48.9%) had a history of being treated for a mental health problem and 40.8% were receiving mental health treatment. Of females with a diagnosed mental disorder, the most frequent diagnoses were depression/dysthymia (75.4%), bipolar disorder (19.7%), and anxiety disorders (18.5%). Alcohol and/or other substance abuse problems were indicated for 15.6% and 19.3% of suicide decedents, respectively, for females. Among females, other than mental health and substance abuse conditions, circumstances noted most often were a crisis of some kind in the preceding or impending 2 weeks (28.8%) and

intimate partner problems (26.3%). Physical health problems also were noted in 20.5% of cases, a precipitating argument or conflict in 16.0% of cases, a family relationship problem in 12.5%, financial problems in 7.7%, death of a family member or friend within the past 5 years in 7.3%, and job problems in 7.3% of cases.

Among the 3,127 female suicide decedents with known circumstance information, 40.6% left a suicide note, 35.1% had a history of suicidal thoughts or plan, 31.9% had a history of suicide attempts, and 22.9% had disclosed suicidal intent to another person. Among the female suicide decedents who disclosed, intent was most often disclosed to their previous or current intimate partner (33.3%) or other family members (31.2%).

Homicides

Sex, race/ethnicity, and age group.—During 2014, there were 1,154 homicides (excluding 19 legal intervention deaths) among females in the 18 NVDRS states (Table 3). The homicide rate for females was about one-third that for males (2.1/100,000 and 7.5/100,000 population, respectively). Non-Hispanic whites accounted for half (49.7%) of the homicides among females but non-Hispanic black females had the highest rate (4.8 deaths/100,000 population), followed by non-Hispanic American Indian/Alaska Native (4.6), Hispanic females (2.0), and non-Hispanic whites (1.5). Among females, age-specific homicide rates were highest (5.5 deaths/100,000 population) among infants aged <1 year, followed by those aged 30–34 years, then those aged 20–24 years (3.6 and 3.4 deaths/100,000 population, respectively). The rate for female infants aged <1 year was almost three times that for female children aged 1–4 years (5.5/100,000 and 1.9/100,000 population, respectively). Rates were lowest among females aged 10–14 years (0.6/100,000 population).

Method and location of injury.—Firearms were used in more than half (52.2%) of female homicides, followed by sharp instruments (17.1%), hanging/strangulation/suffocation (8.7%), and blunt instruments (8.1%). A house or apartment was the most common location of homicide for females (72.0%). The next most common location of homicide for females was a street or highway (7.5%), then a motor vehicle (5.0%). These data are not shown.

Precipitating circumstances.—Precipitating circumstances were identified for 87.4% of female homicides. More than a quarter (28.2%) of those homicides were precipitated by another crime (Table 4). In 49.8% of cases precipitated by another crime, the crime was in progress at the time of the incident. Other common precipitating circumstances identified as a contributing factor among female homicide decedents were IPV related (47.6%), an argument or conflict (30.9%), caretaker abuse/neglect led to death (10.0%), or a crisis within the previous or upcoming 2 weeks (9.7%).

NVDRS Data Access

Basic descriptive NVDRS data can be accessed free of charge from the CDC's National Center for Injury Control and Prevention Web-based Injury Statistics and Query System (WISQARS). The WISQARS is an interactive query system that provides data on fatal and nonfatal injuries in the United States, publically available online. The NVDRS module in WISQARS provides descriptive information on violent deaths available from 2003 to 2014

(the latest data year available) for participating states. The query system provides incident counts as well as crude and age-adjusted death rates by manner of death and cause of injury. Queries can also be tailored to include states, years, age ranges, sex, and racial or ethnic group.

More detailed data from the NVDRS Restricted Access Database (RAD) are available by request (*via* an application process) for researchers meeting certain eligibility criteria. The NVDRS RAD is an anonymous, multistate, case-level microdata set comprising hundreds of unique variables. The NVDRS RAD includes rich narratives to describe the circumstances related to violent deaths, including information from law enforcement and medical examiner or coroner investigative reports.

As mentioned earlier, NVDRS currently operates in 40 states, the District of Columbia, and Puerto Rico. With additional funding from the Consolidated Appropriations Act of 2018, this surveillance system can fully expand to cover all 50 states. Due to the time it takes individual states to collect and upload the deidentified data to the web-based CDC system, data are not available until ~ 18 months after being initiated. Meaningful and comprehensive analyses can and should continue to be conducted regarding suicide and homicide among women. Future analysis regarding homicides and suicides among women along with an examination of differences among women by race/ethnicity, age, and marital status is warranted.

Discussion

The NVDRS data have been used to monitor the occurrence of violent deaths among women, study the characteristics of those deaths, and lead to approaches to address the problem.[23] NVDRS data have also been used to inform stakeholders about the magnitude, trends, and characteristics of violent deaths, identify state- and county-level risk and protective factors for violence, assist with the development of state violence prevention plans, leverage funding for targeted violence prevention efforts, as well as evaluate existing prevention strategies. The Oklahoma VDRS used data regarding IPV-related homicides to secure a grant for a National Institute of Justice study to implement and evaluate a new intervention for police officers responding to domestic violence calls. The intervention was conducted in seven sites from 2009 to 2013. In this intervention, responding police officers conducted the 11-item Lethality Assessment Protocol to determine if the victim was at high risk for homicide. If they determined the victim was at high risk, he or she was put into immediate contact with a local domestic violence service provider who connected him or her with an advocate trained to work with survivors on safety planning, and referral to services.[24] In addition, Oklahoma VDRS data on intimate partner homicides were included in the final report of the National Institute of Justice on the use of a lethality assessment program in police departments.[25]

The data have also been used to inform suicide prevention efforts. Data from the Virginia VDRS revealed that as elders age, the suicide rate decreases for elder women, while it increases for elder men.[26] These data allowed the Virginia Department of Health to develop a comprehensive picture of and targeted prevention efforts for elder suicide through the

identification of unique circumstances faced by the elder population. Also prompted by the release of VDRS data, Virginia funded seven regional suicide summits bringing together violence prevention practitioners in public health and mental health to ultimately develop a regional suicide prevention plan to address at-risk populations.[23] The Virginia VDRS also provided the state's Department of Behavioral Health and Developmental Services with data that helped secure funding for a state suicide prevention coordinator to address suicide issues from a life span perspective.[23] A number of other states have also been able to use VDRS data to monitor trends, describe the burden of suicide, initiate data sharing and collaboration between agencies, and develop suicide prevention and postvention strategies at both the state and local levels.[27,28]

Ongoing research of violent deaths among women is greatly needed for the development of comprehensive suicide and homicide prevention initiatives. As the only surveillance system to compile data from death certificates, C/ME reports, and law enforcement reports, NVDRS data can and should be exhausted to further the knowledge base on women's mortality due to suicide and homicide.

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Table 1.

NUMBER, PERCENTAGE, AND RATE OF SUICIDES, BY DECEDENT'S SEX, AGE GROUP, RACE/ETHNICITY, AND MARITAL STATUS: NATIONAL VIOLENT DEATH REPORTING SYSTEM, 18 STATES, 2014

	Male		*Female*		*Total*	
Characteristic	**n *(%)***	***Rate***	**n *(%)***	***Rate***	**n *(%)***	***Rate***
Age group, years						
<10	*a*	*a*	*a*	*a*	*a*	*a*
10–14	117 (1.0)	3.3	53 (1.6)	1.6	170 (1.1)	2.4
15–19	518 (4.5)	14.3	172 (5.1)	5.0	690 (4.7)	9.8
20–24	966 (8.4)	24.7	203 (6.0)	5.5	1,169 (7.9)	15.3
25–29	892 (7.8)	24.7	218 (6.4)	6.2	1,110 (7.5)	15.5
30–34	925 (8.1)	26.3	246 (7.2)	7.0	1,171 (7.9)	16.6
35–44	1,797 (15.7)	26.8	626 (18.4)	9.2	2,423 (16.3)	17.9
45–54	2,178 (19.0)	30.1	830 (24.4)	11.0	3,008 (20.3)	20.4
55–64	1,953 (17.1)	29.7	635 (18.7)	9.0	2,588 (17.4)	18.9
65–74	1,107 (9.7)	26.6	257 (7.6)	5.4	1,364 (9.2)	15.3
75–84	671 (5.9)	35.1	119 (3.5)	4.6	790 (5.3)	17.7
≥85	313 (2.7)	47.2	36 (1.1)	2.7	349 (2.4)	17.5
Unknown	1 (<1.0)	*b*	0 (0.0)	*b*	1 (<1.0)	*b*
Total	11,438 (100)	21.9	3,396 (100)	6.3	14,834 (100)	13.9
Race/ethnicity						
White, non-Hispanic	9,626 (84.2)	26.6	2,880 (84.8)	7.7	12,506 (84.3)	17.0
Black, non-Hispanic	767 (6.7)	9.8	200 (5.9)	2.3	967 (6.5)	5.9
American Indian/Alaska Native, non-Hispanic	182 (1.6)	30.7	49 (1.4)	8.0	231 (1.6)	19.1
Asian/Pacific Islander	199 (1.7)	9.2	86 (2.5)	3.7	285 (1.9)	6.3
Hispanic[c]	555 (4.9)	10.0	147 (4.3)	2.8	702 (4.7)	6.5
Other	71 (<1.0)	*b*	14 (<1.0)	*b*	85 (<1.0)	*b*
Unknown	38 (<1.0)	*b*	20 (<1.0)	*b*	58 (<1.0)	*b*
Total	11,438 (100)	21.9	3,396 (100)	6.3	14,834 (100)	13.9
Marital status[d]						

	Male		Female		Total	
Characteristic	n *(%)*	*Rate*	n *(%)*	*Rate*	n *(%)*	*Rate*
Married	3,819 (34.5)	[e]	1,105 (34.2)	[e]	4,924 (34.4)	[e]
Never married	3,669 (33.1)	[e]	769 (23.8)	[e]	4,438 (31.0)	[e]
Widowed	608 (5.5)	[e]	254 (7.9)	[e]	862 (6.0)	[e]
Divorced	2,317 (20.9)	[e]	953 (29.5)	[e]	3,270 (22.8)	[e]
Married, but separated	367 (3.3)	[e]	79 (2.4)	[e]	446 (3.1)	[e]
Single, not otherwise specified	171 (1.5)	[e]	41 (1.3)	[e]	212 (1.5)	[e]
Unknown	131 (1.2)	[e]	34 (1.1)	[e]	165 (1.2)	[e]
Total	11,082 (100)	[e]	3,235 (100)	[e]	14,317 (100)	[e]

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Percentages might not total 100% due to rounding.

Per 100,000 population.

Alaska, Colorado, Georgia, Kentucky, Maryland, Massachusetts, Michigan, North Carolina, New Jersey, New Mexico, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin.

[a] Suicide is not reported for decedents aged <10 years, as per standard in the suicide prevention literature.

[b] Rates not reported when number of decedents is <20 or when race/ethnicity or age categories are “Other” or “Unknown.”

[c] Includes persons of any race.

[d] Includes decedents aged ≥18 years only.

[e] Rates cannot be computed for marital status because denominators are unknown.

Table 2.

NUMBER AND PERCENTAGE OF SUICIDES, BY PRECIPITATING CIRCUMSTANCES AND DECEDENT'S SEX: NATIONAL VIOLENT DEATH REPORTING SYSTEM, 18 STATES, 2014

Precipitating circumstances	*Male*, n *(%)*	*Female*, n *(%)*	*Total*, n *(%)*
Mental health/substance abuse			
Currently diagnosed mental health problem	4,427 (43.2)	1,948 (62.3)	6,375 (47.7)
Current depressed mood	3,747 (36.6)	1,142 (36.5)	4,889 (36.6)
History of ever being treated for a mental health problem	3,291 (32.1)	1,529 (48.9)	4,820 (36.1)
Current mental health treatment	2,509 (24.5)	1,275 (40.8)	3,784 (28.3)
Alcohol problem	1,903 (18.6)	488 (15.6)	2,391 (17.9)
Other substance abuse problem (excludes alcohol)	1,521 (14.9)	603 (19.3)	2,124 (15.9)
Other addictions (*e.g.*, gambling or sexual)	57 (<1.0)	24 (<1.0)	81 (<1.0)
Interpersonal			
Intimate partner problem	2,957 (28.9)	823 (26.3)	3,780 (28.3)
Family relationship problem	945 (9.2)	390 (12.5)	1,335 (10.0)
Other deaths of family member or friend within past 5 years	575 (5.6)	227 (7.3)	802 (6.0)
Perpetrator of interpersonal violence within past month	322 (3.1)	28 (<1.0)	350 (2.6)
Other relationship problems (nonintimate)	224 (2.2)	60 (1.9)	284 (2.1)
Suicide of family member or friend within past 5 years	197 (1.9)	83 (2.7)	280 (2.1)
Victim of interpersonal violence within past month	23 (<1.0)	28 (<1.0)	51 (<1.0)
Life stressor			
Crisis within previous or upcoming 2 weeks	3,687 (36.0)	902 (28.8)	4,589 (34.3)
Physical health problem	2,294 (22.4)	642 (20.5)	2,936 (22.0)
Argument or conflict	1,542 (15.1)	500 (16.0)	2,042 (15.3)
Job problem	1,259 (12.3)	227 (7.3)	1,486 (11.1)
Financial problem	1,074 (10.5)	240 (7.7)	1,314 (9.8)
Recent criminal legal problem	1,091 (10.7)	128 (4.1)	1,219 (9.1)
Eviction or loss of home	369 (3.6)	96 (3.1)	465 (3.5)
Noncriminal legal problem	329 (3.2)	74 (2.4)	403 (3.0)
School problem	146 (1.4)	53 (1.7)	199 (1.5)
History of child abuse/neglect	81 (<1.0)	78 (2.5)	159 (1.2)
Traumatic anniversary	57 (<1.0)	26 (<1.0)	83 (<1.0)

Precipitating circumstances	*Male,* n *(%)*	*Female,* n *(%)*	*Total,* n *(%)*
Physical fight (two persons, not a brawl)	63 (<1.0)	11 (<1.0)	74 (<1.0)
Caretaker abuse/neglect led to suicide	4 (<1.0)	8 (<1.0)	12 (<1.0)
Exposure to disaster	12 (<1.0)	0 (0.0)	12 (<1.0)
Crime and criminal activity			
Precipitated by another crime	414 (4.0)	34 (1.1)	448 (3.4)
Crime in progress[a]	99 (23.9)	9 (26.5)	108 (24.1)
Terrorist attack	0 (0.0)	0 (0.0)	0 (0.0)
Suicide event			
Left a suicide note	3,240 (31.6)	1,269 (40.6)	4,509 (33.7)
History of suicidal thoughts or plans	3,121 (30.5)	1,097 (35.1)	4,218 (31.6)
History of suicide attempt(s)	1,645 (16.1)	999 (31.9)	2,644 (19.8)
Suicide disclosure			
Disclosed suicide intent	2,573 (25.1)	717 (22.9)	3,290 (24.6)
Disclosed intent to whom[b]			
Previous or current intimate partner	1,028 (40.0)	239 (33.3)	1,267 (38.5)
Other family members	754 (29.3)	224 (31.2)	978 (29.7)
Friend/colleague	290 (11.3)	105 (14.6)	395 (12.0)
Healthcare worker	90 (3.5)	44 (6.1)	134 (4.1)
Neighbor	42 (1.6)	14 (2.0)	56 (1.7)
Other persons	222 (8.6)	38 (5.3)	260 (7.9)
Unknown	147 (5.7)	53 (7.4)	200 (6.1)
Total suicides with precipitating circumstances	10,241 (100)	3,127 (100)	13,368 (100)

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Includes suicides with one or more precipitating circumstances. Circumstances were unknown for 1,466 decedents (1,197 males and 269 females). Numbers do not equal the sums of the columns because more than one circumstance could have been present per decedent.

Denominator includes only those suicides with one or more precipitating circumstances. The sum of percentages in columns exceeds 100% because more than one circumstance could have been present per decedent.

Alaska, Colorado, Georgia, Kentucky, Maryland, Massachusetts, Michigan, North Carolina, New Jersey, New Mexico, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin.

[a]Denominator includes only those decedents involved in an incident that was precipitated by another crime. Suicide deaths precipitated by this circumstance include situations such as when the suicide victim also committed a homicide or attempted homicide.

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[b] Denominator is decedents who disclosed intent.

Table 3.

NUMBER, PERCENTAGE, AND RATE OF HOMICIDES, BY DECEDENT'S SEX, AGE GROUP, AND RACE/ETHNICITY: NATIONAL VIOLENT DEATH REPORTING SYSTEM, 18 STATES, 2014

	Male		*Female*		*Total*	
Characteristic	**n *(%)***	***Rate***	**n *(%)***	***Rate***	**n *(%)***	***Rate***
Age group, years						
<1	44 (1.1)	6.6	35 (3.0)	5.5	79 (1.5)	6.1
1–4	67 (1.7)	2.5	50 (4.3)	1.9	118 (2.3)	2.2
5–9	21 (<1.0)	0.6	19 (1.6)	[a]	40 (<1.0)	0.6
10–14	37 (<1.0)	1.0	20 (1.7)	0.6	57 (1.1)	0.8
15–19	311 (7.9)	8.6	58 (5.0)	1.7	369 (7.2)	5.2
20–24	805 (20.4)	20.6	126 (10.9)	3.4	931 (18.3)	12.2
25–29	660 (16.7)	18.2	117 (10.1)	3.3	777 (15.2)	10.9
30–34	476 (12.1)	13.5	127 (11.0)	3.6	603 (11.8)	8.6
35–44	598 (15.2)	8.9	199 (17.2)	2.9	797 (15.6)	5.9
45–54	471 (11.9)	6.5	168 (14.6)	2.2	639 (12.5)	4.3
55–64	261 (6.6)	4.0	104 (9.0)	1.5	365 (7.2)	2.7
65–74	129 (3.3)	3.1	62 (5.4)	1.3	191 (3.7)	2.1
75–84	51 (1.3)	2.7	44 (3.8)	1.7	95 (1.9)	2.1
≥85	10 (<1.0)	[a]	24 (2.1)	1.8	34 (<1.0)	1.7
Unknown	4 (<1.0)	[a]	1 (<1.0)	[a]	5 (<1.0)	[a]
Total	3,945 (100)	7.5	1,154 (100)	2.1	5,100 (100)	4.8
Race/ethnicity						
White, non-Hispanic	1,006 (25.5)	2.8	573 (49.7)	1.5	1,580 (31.0)	2.1
Black, non-Hispanic	2,420 (61.3)	31.0	412 (35.7)	4.8	2,832 (55.5)	17.3
American Indian/Alaska Native, non-Hispanic	85 (2.2)	14.4	28 (2.4)	4.6	113 (2.2)	9.4
Asian/Pacific Islander	38 (<1.0)	1.8	21 (1.8)	0.9	59 (1.2)	1.3
Hispanic[b]	358 (9.1)	6.4	107 (9.3)	2.0	465 (9.1)	4.3
Other	23 (<1.0)	[a]	5 (<1.0)	[a]	28 (<1.0)	[a]
Unknown	15 (<1.0)	[a]	8 (<1.0)	[a]	23 (<1.0)	[a]

J Womens Health (Larchmt). Author manuscript; available in PMC 2019 October 31.

Characteristic	Male		Female		Total	
	n (%)	Rate	n (%)	Rate	n (%)	Rate
Total	3,945 (100)	7.5	1,154 (100)	2.1	5,100 (100)	4.8

This table was reproduced from Fowler et al.[1] with permission from MMWR editors.

Percentages might not total 100% due to rounding. Sex was unknown for one decedent.

Per 100,000 population.

Alaska, Colorado, Georgia, Kentucky, Maryland, Massachusetts, Michigan, North Carolina, New Jersey, New Mexico, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin.

[a] Rate is not reported when number of decedents is <20 or when age or race/ethnicity is other or unknown.

[b] Includes persons of any race.

Table 4.

NUMBER AND PERCENTAGE OF HOMICIDES, BY PRECIPITATING CIRCUMSTANCES AND DECEDENT'S SEX: NATIONAL VIOLENT DEATH REPORTING SYSTEM, 18 STATES, 2014

Precipitating circumstances	*Male,* n *(%)*	*Female,* n *(%)*	*Total,* n *(%)*
Mental health/substance abuse			
Other substance abuse problems (excludes alcohol)	306 (10.1)	111 (11.0)	417 (10.3)
Alcohol problem	134 (4.4)	41 (4.1)	175 (4.3)
Currently diagnosed mental health problem	106 (3.5)	50 (5.0)	156 (3.9)
History of ever being treated for a mental health problem	62 (2.0)	33 (3.3)	95 (2.3)
Current mental health treatment	47 (1.5)	25 (2.5)	72 (1.8)
Current depressed mood	9 (<1.0)	9 (<1.0)	18 (<1.0)
Other addictions (*e.g.*, gambling or sexual)	3 (<1.0)	2 (<1.0)	5 (<1.0)
Interpersonal			
Intimate-partner violence related	269 (8.8)	480 (47.6)	749 (18.5)
Family relationship problem	183 (6.0)	83 (8.2)	266 (6.6)
Other relationship problems (nonintimate)	178 (5.9)	35 (3.5)	213 (5.3)
Jealousy (lovers' triangle)	58 (1.9)	48 (4.8)	106 (2.6)
Victim of interpersonal violence within past month	27 (<1.0)	44 (4.4)	71 (1.8)
Perpetrator of interpersonal violence within past month	37 (1.2)	6 (<1.0)	43 (1.1)
Life stressor			
Argument or conflict	1,152 (37.9)	312 (30.9)	1,464 (36.2)
Physical fight (two persons, not a brawl)	430 (14.1)	54 (5.4)	484 (12.0)
Crisis within previous or upcoming 2 weeks	220 (7.2)	98 (9.7)	318 (7.9)
History of child abuse/neglect	25 (<1.0)	21 (2.1)	46 (1.1)
Crime and criminal activity			
Precipitated by another crime	1,228 (40.4)	285 (28.2)	1,513 (37.4)
Crime in progress[a]	711 (57.9)	142 (49.8)	853 (56.4)
Drug involvement	418 (13.8)	50 (5.0)	468 (11.6)
Gang related	207 (6.8)	26 (2.6)	233 (5.8)
Terrorist attack	0 (0.0)	0 (0.0)	0 (0.0)
Homicide event			
Caretaker abuse/neglect led to death	104 (3.4)	101 (10.0)	205 (5.1)

Precipitating circumstances	*Male*, n *(%)*	*Female*, n *(%)*	*Total*, n *(%)*
Victim used a weapon	184 (6.1)	7 (<1.0)	191 (4.7)
Drive-by shooting	115 (3.8)	12 (1.2)	127 (3.1)
Walk by assault	105 (3.5)	11 (1.1)	116 (2.9)
Justifiable self-defense	105 (3.5)	3 (<1.0)	108 (2.7)
Brawl	94 (3.1)	7 (<1.0)	101 (2.5)
Mentally ill suspect	60 (2.0)	41 (4.1)	101 (2.5)
Random violence	59 (1.9)	20 (2.0)	79 (2.0)
Victim was a bystander	39 (1.3)	28 (2.8)	67 (1.7)
Victim was an intervener assisting a crime victim	19 (<1.0)	3 (<1.0)	22 (<1.0)
Prostitution	12 (<1.0)	7 (<1.0)	19 (<1.0)
Victim was a police officer on duty	11 (<1.0)	0 (0.0)	11 (<1.0)
Stalking	3 (<1.0)	6 (<1.0)	9 (<1.0)
Mercy killing	0 (0.0)	6 (<1.0)	6 (<1.0)
Hate crime	2 (<1.0)	1 (<1.0)	3 (<1.0)
Total homicides with precipitating circumstances	3,040 (100)	1,009 (100)	4,049 (100)

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Includes homicides with one or more precipitating circumstances. Total numbers do not equal the sums of the columns because more than one circumstance could have been present per decedent. Circumstances were unknown for 1,051 decedents (905 males and 145 females; sex was unknown for one decedent).

Denominator includes only those homicides with one or more precipitating circumstances. The sum of percentages in columns exceeds 100% because more than one circumstance could have been present per decedent.

Alaska, Colorado, Georgia, Kentucky, Maryland, Massachusetts, Michigan, North Carolina, New Jersey, New Mexico, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin.

[a]Denominator includes only those decedents involved in an incident that was precipitated by another crime.